

Qwest Foundation for Education Competitive Sub-grant Application Assurance Sheet

Project Title: GPS Equipment Purchase & Training Project Amount of Request: \$ 9,950.00
District Name: Joint Highland School District Number: 305

Name of Certificated Teacher (or "lead teacher" if more than one): Shawn Tiegs

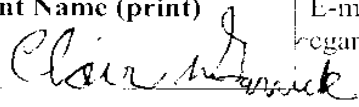
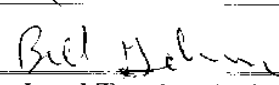
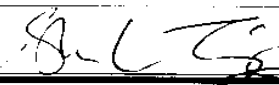
Name of School currently teaching at: Highland Junior/High School

Years taught in Idaho K-12 public education: 5

Content area(s) that you are teaching in Idaho K-12 public education: Earth Science, Physical Science, Biology, Physics, Chemistry, Human Anatomy and Physiology, Botany, Zoology, Applied Science, Applied Math

I certify that if I receive a Qwest Foundation for Education Grant –

- I agree to create a video highlighting my project for the purposes of sharing best practices with other Idaho K-12 teachers.
- I agree to do one presentation on my project to other Idaho K-12 teachers before October 31, 2010.
- I agree to submit an electronic report to the Idaho State Department of Education before October 31, 2010.

Superintendent Name (print) Clair Garrick	E-mail cgarrick@sd305.k12.id.us	Telephone 208-924-5211
Signature: 		
Principal Name (print) Bill Gehring	E-mail bgehring@sd305.k12.id.us	Telephone 208-924-5452
Signature: 		
Teacher or Lead Teacher (print) Shawn Tiegs	E-mail steigs@sd305.k12.id.us	Telephone 208-924-5452
Signature: 		

Abstract

The GPS Equipment Purchase & Training Project will purchase sixteen (16) Global Positioning Satellite (GPS) handheld units with carrying cases and five (5) laptops to process information gathered by the GPS units for the Highland Junior Senior High School Science classes. This project will implement a new technology training project for students' grades 8-12. Introducing GPS into the classroom will be an innovative way to create a link between technology and its practical application; and improve student performance.

Highland School is unable to introduce this and other technology into the classroom due to financial limitations thus, more specifically; the school suffers a lack of everyday applications in the science classroom.

Highland Joint School District # 305 accommodates youth in Grades K-12 from the remote, rural communities of Craigmont, Winchester, and Reubens, Idaho. These communities are located on the Camas Prairie in north central Idaho, in Lewis County, and within the Nez Perce Indian Reservation. Inclimate weather and heavy snows leaves area residents with little opportunity to travel. The population of Craigmont is 520, Winchester 293, and Reubens 72. Craigmont and Winchester have experienced a 5.6% and 3.6% decrease, respectively, and Reubens 1.39% increase since 2000. Median resident ages are 39.3, 47.3, and 38. Many families and farms in this area are multi-generational. The major industry of the region is farming. Most families in the area are involved in the farming industry as producers, processors or distributors. These communities have been hard hit with the decline of the farming and forestry industries. In the past three years four (4) major employers; three (3) granaries in Craigmont, and Winchesters only lumber mill; have closed and in Craigmont one granary is now foreign owned. The median household income for Lewis County residents is \$31,413 compared to the Idaho median household income of \$46,253. More than sixty-five percent of Highland School students qualify for the free/reduced lunch program but this is misleading as most families don't apply because of family tradition and misplaced pride.

GPS and similar technologies are important and useful in rural Idaho as GPS grows in popularity and everyday normal use. Employment opportunities utilizing technology are growing in the major areas of regional/local employment; farming, forestry, mining and tourism. Local historical societies are looking for ways to map historical sites. Youth being trained in GPS technology becomes especially important as the traditional operation of these employment areas decline if they wish to carry on their heritage of Craigmont and Winchester being third generation communities. These communities are seeing the out migration of their youth and families due to lack of livable wage employment opportunities causing a shift to an aging population. This shift drastically impacts the social and economic well-being of the communities.

The purchase of sixteen (16) Global Positioning Satellite (GPS) handheld units with carrying cases and Five (5) laptops will introduce this technology into the classroom for assignments and projects; enabling our students to be more successful individually and more competitive with their counterparts as they expand their horizons past that of rural Craigmont and Winchester, ID.

Current Innovation

Highland School classes have been working in conjunction with the National Park Service (NPS) counting and tracking camas plants and invasive species on the Weippe Prairie at a NPS site. The NPS has provided the students with a one (1) day of training on use of GPS units and two (2) days of training on the historical and biological importance of this study. Students have gained a large amount of knowledge of both the operation of GPS units along with problem solving abilities, and the ability to see potential science and technology based applications in the real world. Several students have become interested in GPS and its biological applications as a result of this on-going study. This project has been great for the students but we have been severely limited in our prep work having to rely on the National Park Service for the use and training of GPS units. Students involved in this project during the second semester have seen increased test scores and a reduced failure rate in their class when compared to the first semester.

Highland School is currently implementing technology in the form of Vernier probe ware allowing students to do experiments with the chemistry, physics, and physical science in which data can be collected by computers; the results can quickly be plotted, graphed, and analyzed. This has greatly increased the students understanding of the physical sciences. It has helped prepare those students interested in pursuing a college level education by helping them become familiar with the technology that is similar to those used in universities and in the workplace. While direct data as to improvement of scores has not been available, it is my opinion the students are much better prepared for the college/science environment as a result of this technology and hands on experience.

Project Description

The GPS Equipment Purchase & Training Project will purchase sixteen (16) Global Positioning Satellite (GPS) handheld units with carrying cases and five (5) laptops to process information gathered by the GPS units for the Highland Junior Senior High School Science classes. This project will implement a new technology training project for students in grades 8-12. Introducing GPS into the classroom will be an innovative way to create a link between technology and its practical application; and improve student performance.

Project Objectives

Our objectives with this project are to:

- Implement GPS training for student's grades 8-12.
- Implement GPS applications in conjunction with community organizations.
- Implement advanced level applications of GPS technology.

Classroom Innovative Activities

The activities we will include in the use of the GPS devices include:

- Map local cemeteries
- Geocaching
- Map local historical sites
- GPS waypoint training
- Compass vs. GPS comparison
- Speed/Distance Calculations

Team Members

Project Team Members	
Name	Involvement
Shawn Tiegs	Head Science Teacher, implementation of GPS curriculum
Clair Garrick	Superintendent, Highland Joint School District #305
Bill Gehring	Principal, Highland Schools
Bette Stone	7th grade science teacher, assist in implementation of GPS curriculum
Randy Navilinski	History teacher, assist in implementation of GPS curriculum, assist with historical Sites & cemetery presentations to community
Byron Bovey	Local historian, assist in historical site and cemetery site knowledge
Alyze Cadez	National Park Ranger, assist in camas and invasive species study currently being conducted by National Park Service. Provide training to students on use of GPS for environmental studies

Feasibility

GPS and similar technologies are important and useful in rural Idaho as GPS grows in popularity and everyday normal use. Employment opportunities utilizing technology are growing in the major areas of regional/local employment; farming, forestry, mining and tourism. Youth being trained in GPS technology becomes especially important as the traditional operation of these employment

areas decline if they wish to carry on their heritage of Craigmont and Winchester being third generation communities.

Sustainability

The developed curriculum utilizing GPS technology will be integrated into to classroom Idaho Education Standards requirements. Applicable standards are:

Science - Standard 1: Nature of Science. Goal 1.2: Understand Concepts and Processes of Evidence, Models and Explanations. Goal 1.3: Understand Consistency, Change and Measurement. Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills. Goal 1.8: Understand Technical Communication. Standard 5: Personal and Social Perspectives and Technology. Goal 5.2: Understand the Relationship between Science and Technology.

Math – Standard 2: Concepts and Principals of Measurement. Goal 2.1: Understand and Use US Customary and metric measurements. Standard 4: Concepts and Principals of Geometry. Goal 4.3: Apply graphing in two dimensions. Standard 5: Data Analysis, Probability and Statistics. Goal 5.1: Understand Data Analysis. Goal 5.2: Collect, Organize and Display Data. Goal 5.3: Apply Simple Statistical Measurement. Goal 5.5: Make Predictions or Decisions Based on Data.

Technology – Standard 1: Basic Operations and Concepts. Goal 1.1: Students demonstrate a sound understanding of the nature and operation of technology systems. Goal 1.2: Students are proficient in the use of technology. Standard 2: Social, Ethnical and Human Issues. Goal 2.2: Students practice responsible use of technology systems, information and software. Goal 2.3: Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity. Standard 3: Technology Productivity Tools. Goal 3.1: Students is technology tools to enhance learning, increase productivity, and promote creativity. Goal 3.2: Students use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works. Standard 5: Technology Research Tools. Goal 5.1: Students use technology to locate, evaluate, and collect information from a variety of sources. Goal 5.2: Students use technology tools to process data and report results. Goal 5.3: Students evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks. Standard 6: Technology Problem-Solving and Decision Making Tools. Goal 6.1: Students use technology resources for solving problems and making informed decisions. Goal 6.2: Students employ technology in the development of strategies for solving problems in the real world.

Integrating GPS technology into the curriculum will also impact teacher professional development Outdoor Education Standards. Applicable standards are:

Standard 1: Content knowledge. (1) Influence of Wilderness in American Culture. (2) Background in Subjects with Historic and Traditional Importance in Outdoor Field. Standard 2: Teaching and Leadership Strategies. (1) Teaching Styles. (2) Assessment and Evaluation. (3) Adventure Game and Team Building Programming. (4) Decision Making and Problem Solving. (5) Lesson Plan Development. (6) Methods of Teaching Outdoor Recreation Activities. (7) Practicum Experience in Teaching and/or Leading Outdoor Activities. (8) Field Experience in Teaching and/or Leading Outdoor Activities. Standard 3: Safety and Minimal Impact. (1) “Leave No Trace” Principals. (2) Ethics of Wildland Use. (3) Field Experience Minimal Impact Techniques. Standard 5: Experimental Skills and Field Experience. Development of personal skills in selected outdoor activities. (1) Knowledge of the Application of Outdoor Activity Techniques. (2) Familiarity with

Equipment and Clothing Required in Selected Outdoor Activities. (3) Understanding of the Safety Procedures of Selected Outdoor Activities. (4) Practicum Experience in Teaching and/or Leading Outdoor Activities. (5) Field Experience in Teaching and Leading Outdoor Activities. (6) Field experience organizing a public service/community conservation project.

The GPS technology curriculum will enhance classroom lessons, increase student interest and success, and provide a tool for teachers to improve their teaching techniques and effectiveness in the classroom. Having a successful, interesting program for both students and teachers guarantees its continued long term use

School District Support

Developing the GPS curriculum that satisfies both the Idaho Education Standards and the Outdoor Education Standards creates buy-in for school administration and teaching staff. Highland teachers teaching math, science, history and technology are excited and will use the GPS curriculum within their course studies. Administration will recognize teachers that incorporate innovative teaching methods within their everyday, required lessons as they challenge and enlighten students. Students become successful in these conditions. This is a win-win for everyone.

Anticipated Outcomes/Impact

This project is beneficial to our students because it will:

- Improve students' interest in science and technological fields.
- Increase class participation with hands on experience.
- Increase the students' exposure to activities that are applicable to everyday life.

This project will:

- Improve students' critical thinking and problem solving skills.
- Increase performance on class activities and tests.
- Increase awareness of potential employment in scientific/technological fields.

We anticipate that:

- 40% of our students will pursue science/technological fields of study after graduation.
- 25% Improvement on science standardized testing scores
- 100% of Highland High School students will pass ISAT every year with newly acquired interest in science and acquired problem solving skills.
- 25% Improvement in community participation in educational process.

Scope & Sequence

Strategies/Timeline/Activities/Responsible

- Project Begins - January – March 2010. Activity–Begin GPS curriculum planning. Responsible–S. Tiegs, B. Gehring, R. Frei. *March 2010.* Activity–Administration approves curriculum. Responsible–B. Gehring, C. Garrick, School Board.
- Implement GPS Training for Students Grade 7-12 - April 2010 Activity–Purchase GPS Units, laptops and other project related supplies. Responsible–S. Tiegs, I. Breen. Activity–Students begin journals. Responsible–S. Tiegs, students grades 8-12. Activity–Student GPS Waypoint curriculum begins. Responsible–S. Tiegs, grades 8-12. Activity–Student compass vs. GPS curriculum begins. Responsible–S. Tiegs, B. Stone, grades 7, 8 & 10. Activity–Student speed/distance calculations curriculum begins. Responsible–S. Tiegs, grades 9, 11 & 12.
- Implement Applications in Conjunction with Community Organizations - May 2010. Activity–Map cemetery site. Responsible – S. Tiegs, grades 7 & 9. Activity–Map and interpret local community sites. Responsible–S. Tiegs, grades 8 & 10. Activity–Camas mapping project in conjunction with Nezperce National Park Service. Responsible–S. Tiegs, A. Cadez, grade 10. Activity–Videotape during data collection field trips. Responsible–S. Tiegs, grades 7-10.
- Continue GPS Application in Conjunction with Community Organizations - June 2010. Activity–Students graded on local community sites and camas mapping project. Responsible–S. Tiegs. Activity–Local community site mapping presentation to City Council and Lions Club. Responsible–grades 8 & 10, S. Tiegs. Activity–Local cemetery site mapping presentation to Historical Society. Responsible – grades 7 & 9, S. Tiegs. Activity–Begin video editing. Responsible–S. Tiegs.
- Implement Advances Level Applications of GPS Technology - August 2010. Activity–Teacher in-service day training. Responsible–B. Gehring, S. Tiegs, R. Frei, all Highland 8-12 teachers. *September 2009.* Activity–Historical data field trip and mapping. Responsible–S. Tiegs, R. Navilinski, B. Bovey, grades 8–12. Activity–Students graded on historical site mapping. Responsible–S. Tiegs. Activity–Historical site presentation to City Council, Historical Society and Lions Club. Responsible–grades 8 & 11, S. Tiegs, R. Navilinski, B. Gehring, C. Garrick. Activity–Walking local community site data collection field trip and mapping. Responsible– S. Tiegs, grades 8–12.
- Video Highlighting Project - October 2010. Activity–Video edited, completed and converted to CD format. Responsible–S. Tiegs, R. Frei, grades 8-12. Activity–Project presentation including student & video to 5 regional schools. Responsible–S. Tiegs, grades 8-12.
- Electronic Final Report - October 2010. Activity–Electronic final report to Idaho Department of Education. Responsible–S. Tiegs, B. Gehring, C. Garrick.
- Replicable GPS Project Implemented - October 2010 – Ongoing. Activity–GPS project continues at Highland and adopted by other Idaho schools. Responsible–Highland and other teachers as appropriate.

Evaluation Measures

(1) GPS curriculum developed and approved. (2) Improved student critical thinking and problem solving skills. (3) Increased student interest in science and technical fields. (4) Increased understanding of Newtonian Physics. (5) Completed community mapping – Local, Cemetery, Historical & Regional. (6) Increased class participation with hands-on and activities that are applicable to everyday life. (7) Increased performance on in-class activities and tests. (8) Increased awareness of potential employment in scientific/technology fields. (9) Improved science standardized testing scores. (10) Improved ISAT test scores with newly acquired interest in science and acquired problem solving. (11) Increase of students pursuing science/technology fields of study after high school graduation. (12) Improved community participation in educational process. (13) Replicable project and curriculum in other schools.

Budget Narrative

Use of Qwest Funds

Activity	Materials/Supplies	Capital Objects	Quantity	Price/ Unit	Total
Implement GPS		GaminGPSMAP60CSx	15	\$330.00	\$4,950.00
Training		Dell Latitude Laptop Computers	5	\$1,000.00	\$5,000.00
Total Qwest Funds					\$9,950.00

Narrative: A class set of 15 GPS units will be purchased for instructional training and field work purposes to collect, record, and analyze data. Students will work in teams of two (2). Purchase also includes protective carrying cases for each GPS unit. A class set of five (5) laptop computers will be purchased for field and classroom data entry and processing will be purchased for field and classroom data entry and processing.

Use of Non-Qwest Funds

Activity	Materials/Supplies	Capital Objects	Quantity	Price/ Unit	Total
Implement GPS Training	AA Batteries 8 Pack		10	\$6.00	\$60.00
	Student Journal		75	\$3.00	\$225.00
	Computer Paper		1 case	\$35.00	\$35.00
	Printer Cartridges		10	\$35	\$350.00
	Report Folders		20	\$8.00	\$160.00
Total					\$830.00

Narrative: A supply of replacement batteries is needed for continued operation of the GPS units. Each student will be given a composition type notebook to be used as their project journal. These journals will be on-going for student participation from one grade level to the next. This will help demonstrate personal understanding and growth. One case of paper will be purchased for computer printing of data for oral report visual aide and written reports. Students will be working in pairs to collect data but each will prepare and individual report based on their findings.

Qwest Funds: \$9,950.00

Non Qwest Funds: \$830.00

Total Implementation Cost: \$10,780.00

Activity	Materials/Supplies	Capital Objects	Quantity	Price/ Unit	Total
Implement Activities, and Curriculum	Sack Lunches		282	\$3.00	\$846.00
	Bus Driver		20 hours	\$7.50/hr	\$150.00
	Bus Mileage		440 miles	\$2.40/miles	\$1056.00
Video Highlight Presentation	Videotape		1	10.00	\$10.00
	CDs		(1) 25 pack	\$15.00	15.00
Total					\$2,077.00

Narrative: Highland Schools lunch program will provide 40 lunches for 7 & 9th grade students and chaperones for the cemetery site mapping field trip, 41 sack lunches for 8th & 10th grade students + chaperones for the local interest field trip, 21 for the camas mapping field trip, 90 sack lunches for 8th - 12th grade students + chaperones for the historical data field trip, and 90 sack lunches for 8th - 12th grade students + chaperones for the walking data field trip. Lunches will be required for the three (3) field trips: cemetery - 2 hours, camas - 6 hours, and historical - 6 hours x 2. Highland computes the cost of bus transportation by the mile. Transportation costs for the field trips are: cemetery - 40 miles, camas - 100 miles, and historical - 150 miles x 2 busses.

A presentation will be made to other educators about this project. One video tape will be purchased to be used in videotaping the activities and presentations of the project. Video tape will be converted to CD format to share with other schools.

Qwest Funds: \$0.00

Non-Qwest Funds: \$2,077.00

Total Activity Cost: \$2,077.00

Total Qwest Funds: \$9,950.00

Total Non-Qwest Funds:..... \$2,907.00

Total Project Cost:\$12,857.00

Qwest Foundation for Education Grant GPS Equipment Purchase & Training Project

Activity	Materials and Supplies	Capital Objects	Quantity	Price per unit	Qwest	Highland	Total
Implement GPS Training		GPS hand-held units w/ cases	15	\$330.00	\$4,950.00		\$4,950.00
		Laptops	5	\$1,000.00	\$5,000.00		\$5,000.00
	AA Batteries		10	\$6.00		\$60.00	\$60.00
	Student journals		75	\$3.00		\$225.00	\$225.00
	Computer paper		1	\$35.00		\$35.00	\$35.00
	Printer cartridges		10	\$35.00		\$350.00	\$350.00
	Report folders		20	\$8.00		\$160.00	\$160.00
Implement GPS Applications	Sack lunches		282	\$3.00		\$846.00	\$846.00
	Bus Driver		20	\$7.50		\$150.00	\$150.00
	Bus Mileage		440	\$2.40		\$1,056.00	\$1,056.00
Video Highlighting Project	Videotape		1	\$10.00		\$10.00	\$10.00
	CDs		1	\$15.00		\$15.00	\$15.00
Grand Total					\$9,950.00	\$2,907.00	\$12,857.00